T. MORRIN.

CENTRIFUGAL OIL BURNER.

APPLICATION FILED FEB. 13, 1911.

1,025,153.

Patented May 7, 1912.

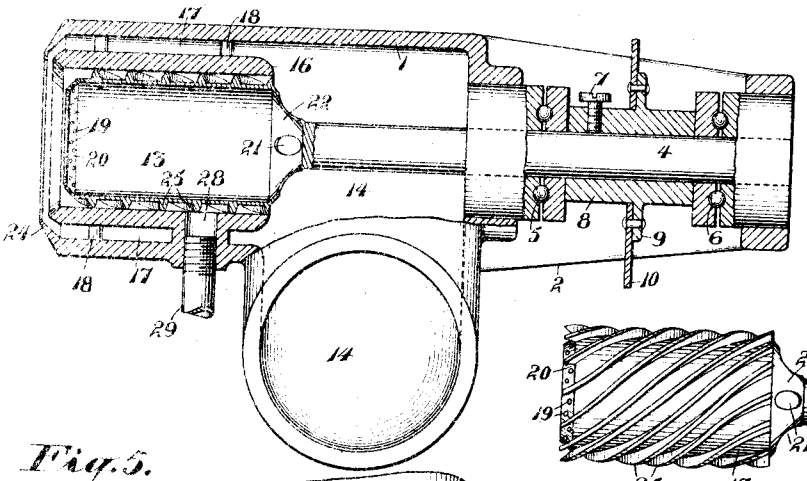


Fig. 2.

Fig. 3.

Fig. 5.

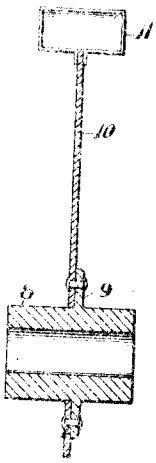
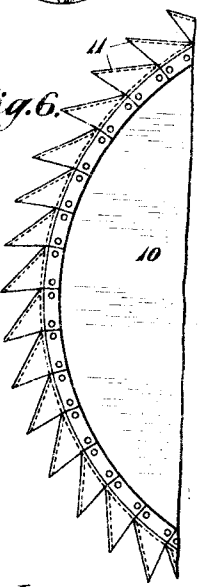


Fig. 1.

Fig. 4.

Fig. 6.



Witnesses—

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UNITED STATES PATENT OFFICE.

THOMAS MORRIN, OF SAN FRANCISCO, CALIFORNIA.

CENTRIFUGAL OIL-BURNER.

1,025,153. Specification of Letters Patent. Patented May 7, 1912.

Application filed February 13, 1911. Serial No. 608,206.

To all whom it may concern:

Be it known that I, THOMAS MORRIN, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Centrifugal Oil-Burners, of which the following is a specification.

The present invention relates to improvements in centrifugal oil burners, the object of the invention being to provide a burner of this character which will be of greater simplicity and economy of construction, containing but few parts, and with simple connections; which can be operated by a small expenditure of energy, and in particular by pressure fluid of a comparatively low pressure, and in which a very complete atomization of the oil is effected.

In the accompanying drawing, Figure 1 is a side view of the apparatus; Fig. 2 is a horizontal section on the line 2—2 of Fig. 1; Fig. 3 is a side view of the atomizing head detached; Fig. 4 is an end view of the same; Fig. 5 is a detailed sectional view of the impact motor; Fig. 6 is a broken detail side view of the same.

Referring to the drawing, 1 indicates the casing of my improved burner, which is formed at one end with a depending U-shaped portion or yoke 2, formed to receive therein an impact motor 3, secured to a horizontal shaft 4, which rotates between roller bearings 5, 6, in the terminal portions of said yoke-shaped portion of the casing. Said shaft 4 is secured by a set screw 7 or other fastening to a sleeve or hub 8, having a flange 9, to which is riveted a web 10, to the outer edge of which are attached impact buckets 11. A pipe 12 connects compressed fluid, preferably air, to said buckets and imparts rotation thereto. Said shaft 4 is formed at one end with an atomizing head 13, which is hollow and cylindrical and of considerably greater diameter than the shaft, and into the interior of said head, air or other fluid under pressure is supplied by a receiving conduit 14, in the end of which the end of a conduit 15 is inserted. Said head rotates within an inner cylindrical wall 16 of the casing, spaced from the outer wall of the casing to provide an air passage 17, but connected therewith at suitable intervals by eight supporting ties 18. Said head is closed at its outer end except for two circular rows of small apertures 19, formed on a beveled annular marginal portion 20 thereof. The air emerging through said apertures from the interior of the head is supplied thereto through holes 21, formed in a conical or converging end 22 of said head, connecting it with the shaft. From said annular air passage 17 the air emerges by an annular narrow port 24 which is preferably conical and inwardly convergent. On the outer surface of said head are formed a considerable number, as twelve, of helical ribs 25, the outer surfaces of which rotate closely adjacent to the inner surface of said cylindrical wall 16. Oil is supplied to the interior of said cylindrical wall 16 by means of a passage 28 leading through one of said tie members 18, which is considerably enlarged for that purpose.

The following is the mode of operation of the apparatus:—By the branch pipe 12 pressure fluid is supplied to the motor, and the shaft is thereby rotated at great velocity. Oil supplied by the pipe 29 is thereby conveyed to the end of the head by the helical ribs on said head, and is likewise divided by the successive passage of the several ribs past the entrance of the passage 28, into minute portions, and, when impelled from the end of said cylindrical wall, having attained the high velocity of the rotating atomizing head, is furthermore minutely subdivided by centrifugal force. Air is supplied to said oil in three ways; it is introduced into the helical spaces between the inner surface of said cylindrical wall 16 and the helical ribs, and is conducted, together with the oil, to the outer end of said wall 16; it is conducted into the interior of said hollow head and then through the minute apertures 19 in the outer end thereof; and it is conducted by the passage between the inner wall 16 and the casing 1, being discharged by the narrow annular port at the end thereof. Moreover it is to be observed that the air is delivered to the oil by each of said three methods at a different angle. By reason of the oil being supplied with air in three different channels and in three different directions, the oil is very thoroughly mixed with the air and complete combustion takes place.

By unscrewing the set screw 7, the shaft can be adjusted longitudinally in the hub 8, and consequently the outer end of the atom-

izing head can be adjusted relatively to the annular port 24 through which the greater part of the air supply is conducted.

An important feature of my invention is that two of the air conduits, namely, those through the hollow head, are rotating, while the third air conduit is stationary. By reason of this fact, and the further fact that the oil itself when delivered from the atomizing head is also rotating, a very thorough mixture of air and oil, and atomization of the oil is produced.

I claim:—

1. The combination of a cylindrical wall, an oil pipe leading to the interior thereof, a rotatable hollow head within said wall provided with a helical rib fitting snugly within said wall and adapted to rotate past the inlet opening for the oil, means for conducting air into the interior of said hollow head, said hollow head being at the end remote from the part at which the air enters, closed except for small apertures directed obliquely outward, and means for rotating said head.

2. The combination of a cylindrical wall, an oil pipe leading to the interior thereof, a rotatable hollow head within said wall provided with a helical rib fitting snugly within said casing and adapted to rotate past the inlet opening for the oil, means for conducting air into the interior of said hollow head, said hollow head being formed, at the end remote from the part at which the air enters, with openings directed obliquely outward, the corresponding end of the wall having an inner surface flaring outward at substantially the same angle as said openings, and means for rotating said head.

3. The combination of a cylindrical wall, a head rotatable therein, provided with helical ribs fitting snugly within said wall, means for conducting oil to the space between said head and wall, a casing surrounding the wall and spaced therefrom, and means for conducting air to said space between said casing and wall, the casing being formed with an annular flange directed obliquely inward, and the corresponding end of the wall being formed with a surface directed obliquely outward.

4. The combination of a cylindrical wall, one end of which is formed with an outwardly flaring inner surface, and an inwardly converging outer surface, a casing surrounding the wall and spaced therefrom, formed at the corresponding end with an inwardly converging inner surface, means for conducting air between the wall and casing, a head rotatable in said wall, and provided with helical ribs fitting snugly within said wall, means for conducting oil to the space between said head and wall, said head being formed at the end corresponding to the aforesaid ends with openings directed obliquely outward.

5. The combination of a casing and an inner wall spaced from each other to form an annular air passage, a rotatable hollow head within the wall and longitudinally adjustable therein provided with helical ribs fitting snugly therein, means for conducting oil to the space between said head and wall, means for conducting air to the interior of said head and to said annular passage, said wall and casing being formed to provide a discharge end for said passage directed obliquely inward, said hollow head being formed at the end corresponding with the said end of said passage with an annular series of outlets directed obliquely outward, and means for securing said head in said wall.

6. The combination of a casing, a cylindrical inner wall spaced from the casing to form a fluid passage, means for supplying compressed fluid to said passage, said casing and wall forming at the outer end of said fluid passage an inwardly convergent annular port, a cylindrical hollow atomizing head within said wall and having helical ribs on its outer surface, said atomizing head being formed at one end with means for admitting compressed fluid to the interior thereof and at the other end with a plurality of small apertures, means for supplying oil to the space between the head and wall, and means for rotating said head.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

THOMAS MORRIN.

Witnesses:
N. B. KEATING,
FRANCIS M. WRIGHT.